Chapter 6 CREW RESOURCE MANAGEMENT (CRM)

A. BACKGROUND

1. Crew Resource Management (CRM) was originally known as 'Cockpit Resource Management'. CRM deals with resource management in flight operations. It is defined as the effective utilization of all available resources. Resources include autopilots, other avionics systems, operating manuals, and people, including crewmembers, air traffic controllers, and others in the aviation operating environment.

2. Human error continues to be the single largest causal factor in aviation accidents. Current statistics indicate that 70-80% of all aviation accidents are attributable to human error. Although this manual cannot cover all of the facets of CRM, some highlights are presented. Mounting accident/incident data suggests that while superior airmanship is an essential component of what we do, it is insufficient in and of itself to assure flight safety. Safe and efficient Auxiliary flight operations depend on teamwork and understanding of human behavior. A good reference is the FAA Advisory Circular 120-51B. The goal of CRM is to improve individual and crew performance by using all the resources available to minimize the risk. Some of the indicators are:

   a. Situational Awareness

   b. Stress and performance

   c. Decision Making

   d. Attitude and Crew performance

   e. Effective Communication

   f. Information Processing

3. Information on current developments in CRM can be obtained on the internet at: http://www.caar.db.erau.edu/crm/

4. The principles of CRM shall be used in the Coast Guard Auxiliary aviation program. These principles apply even in the single pilot environment by using all available resources both in the cockpit and on the surface. The human factor is the single most important element for safe and effective aircraft operations. An understanding of CRM will help the pilot to better utilize the crew and at the same time will help the crew to understand that they must take an active part in the operation of each flight.

B. CRM STUDY

1. This study emerged from the circumstances surrounding the crash of a DC-8 on approach to the Portland, Oregon International Airport on 28 December 1978. The investigation revealed that the captain, a pilot with over 27,000 flight hours, 5,500 hours in type, lost "situational awareness" while attempting to resolve a minor problem with the landing gear. This loss of situational awareness, manifesting itself in the captain's disregard for the input from his first officer and engineer, resulted in the aircraft running out of fuel six miles from the airport. Based on their investigation, the National Transportation Safety Board (NTSB) issued the following statement:

   Probable cause: Failure of the captain to monitor the aircraft fuel state, to respond to the low fuel indications, and his failure to respond to the crewmembers advisories regarding the fuel state. Contributing to the accident was the failure of the other two flight crewmembers to either fully comprehend the critical nature of the fuel state or to successfully communicate their concerns to the captain.

   Safety recommendation: Encourage all commercial air carriers to have their flight crews indoctrinated in the principals of flight deck resource management with particular emphasis on the merits of participatory management for captains and assertive training for other cockpit crew members. As a result of the investigation and the recommendation of the NTSB, that airline, and three other airlines, immediately started presenting CRM training to their flight crews. In addition, a spin-off training called Line Oriented Flight Training (LOFT), also was derived. LOFT training is accomplished in simulators where flight crews are confronted with emergencies, or other situations that require and measure their ability to interact effectively to resolve problems.

2. The three key concepts in the above study are:

   a. Participation by all crewmembers in all aspects of the flight.

   b. All crewmembers should have an understanding of the basic elements for safe flight.

   c. Crewmembers should be able to communicate effectively within the flight environment.

C. CRM CONCEPT

1. Performance: Effective performance depends on both technical performance and interpersonal skills.

2. Focus: CRM focuses on crewmember attitudes and behaviors. A primary focus of CRM is effective team coordination. The team encompasses the flight crew, air

traffic controllers, maintenance, and other groups that interact with the cockpit crew. Effective CRM involves the entire flight crew. CRM is not simply the responsibility of the pilot in command, nor should CRM be viewed as pilot training. All crewmembers are responsible for the effective management of the resources available to them.

3. Acquisition of CRM skills: The acquisition of effective CRM skills requires the active participation of all crewmembers. Effective resource management skills are not gained by passively listening to classroom lecture, but by active participation and practice on each flight.

4. Motivation of crewmembers: The pilot in command must maintain a positive climate on the flight deck and encourage crewmembers to fully participate in crew activities. Creating the proper climate is important. This can be done by maintaining an "open" cockpit atmosphere, having the crewmembers speak up when things do not seem right, or ask questions if they do not understand. It is up to the pilot in command to promote positive relations by providing non-punitive critique and feedback.

5. Assertiveness: Assertive behavior indicates highly developed skills in both task and relationship and is most likely to produce an assertive response from other crewmembers and insure the open exchange of information. As a pilot in command, you have the authority to either accept or reject the advice or opinion of others. Listening and responding to your flight crew does not mean abdicating command.

D. RULES

1. These rules were primarily developed for the flight deck of an air carrier, but the principles are valid for the Auxiliary aviation environment that will probably be a pilot and one or two observers or air crew. The basics are as follows:

   a. In abnormal situations, the first order of business must be to decide who flies the aircraft and who monitors or works on the problem.

   b. Positive delegation of monitoring duties is as important as positive delegation of flying duties.

   c. The pilot flying must not attempt to accomplish secondary tasks during busy portions of a flight.

   d. Whenever uncertainty or conflicting opinions of fact occur, such as a misunderstood radio transmission, the conflict must be resolved unequivocally using external sources of information. (For example, request a repeat of the transmission.)

e. If any crewmember has doubts about a clearance, procedure or flight condition, he or she is obligated to make that doubt known to other crewmembers.

f. Distractions should be minimized especially during key parts of the flight. A sterile cockpit concept (no conversation) should be enforced during take off and landings. No cross conversation when outside communications are being transmitted.

g. The use of checklists is to be mandated. The occupant of the right seat should read the checklist to the pilot.

E. RESPONSIBILITIES

1. The pilot in command of an Auxiliary aircraft is responsible for the safe and orderly conduct of the flight. This responsibility and authority exists from the time the pilot begins flight/mission planning until completion of the flight. It is imperative that flight crewmembers be aware of the authority of the pilot in command and be ready to comply quickly with his/her instructions. The successful completion of the mission or the safety of the crew may be jeopardized if the scope of this authority is not clearly understood.

F. CONCLUSION

1. CRM starts prior to the flight. The concept should be developed at Coast Guard Auxiliary aviation safety workshops. The next step is for the pilot to review CRM at the pre-flight briefings. Have the crew participate in pre-flight aircraft system checks. Go over emergency procedures as well as standard operating procedures. Clarify the roles of all crewmembers for each aspect of the flight.

2. The next step takes place during the flight. Practice what was learned on the ground.

3. The final step takes place at the post flight wrap up. What could have been done differently? What procedures should be changed next time? What went well with the flight?

CRM is one of the MANDATED topics at the REQUIRED annual Coast Guard Auxiliary aviation safety workshops.